



Minimizing and Planning for Supply Chain Risk

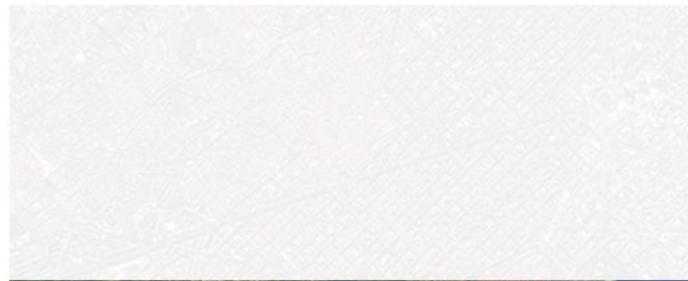
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Background

- Supply Chain, formally known as purchasing used to be thought of as a clerical function, until recently. This is a change in mindset and taking years to develop.
- Supply chain and the management of it, can be a competitive advantage at its best, or devastate a program or product line if it fails.
- Supply chain needs to be strategic and integrated into business strategies, from capture to execution.
- Appropriate supply chain design, execution, risk assessment and mitigation needs to be evaluated for each commodity , program and the customer base and market it serves.



Supply Chain Design

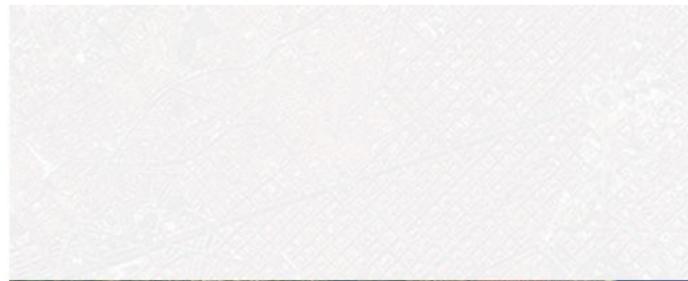
Supply Chain Risk strategies

High Risk Supply

Component Price	High	<ul style="list-style-type: none">• No Component	<ul style="list-style-type: none">• Partnerships• Risk-sharing contracts• Tracking performance• Sharing experience
	Low	<ul style="list-style-type: none">• Inventory	<ul style="list-style-type: none">• Inventory• Dual sourcing• Flexibility
		Low	High

Financial Impact

Source : **Operation Rules** : Author: David Simchi-Levi



Supply Chain Team

Team Building



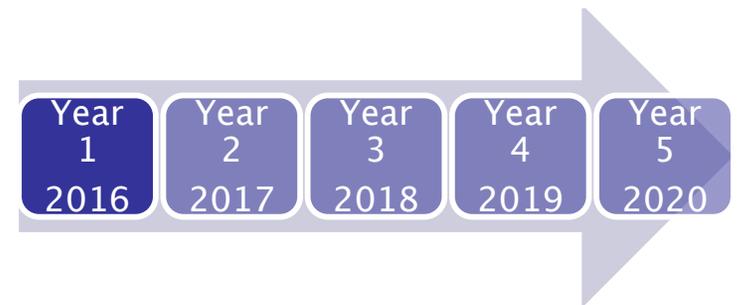
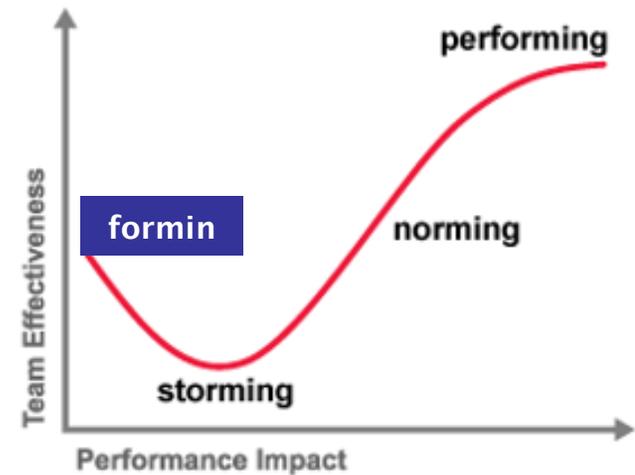
Forming	The team act as individuals and there is a lack of clarity about the team's purpose and individual roles.
Storming	Conflict arises as people begin to establish their place in the team.
Norming	There is a level of consensus and agreement within the team. There is clarity about individual roles. The role of the leader is important in managing this.
Performing	The group has a clear strategy and shared vision. It can operate autonomously and resolve issues positively.

Adapted from Tuckman 1965

- **Forming.** This is when a team comes together. This stage is characterized by excitement, optimism and anticipation of what the future will bring.
- **Storming.** At this stage reality sets in and it doesn't quite match what was expected. Members may become dissatisfied and/or frustrated. There is some anxiety as they are adjusting to the fact that the team isn't working out quite the way that they thought it would. At this point there is a resistance, conflict and emotions tend to run high. Members may start looking out for themselves instead of doing what is best for the team.
- **Norming.** At this stage the team has worked out most of the issues. They understand the idea of shared goals, and have learned to cope and accept each other. There is a sense of relief and lowered anxiety, as the members are engaged and supportive of each other.
- **Performing.** At this stage the team is performing at a very high level. They truly understand each other, and have a strong sense of teamwork and cohesiveness.

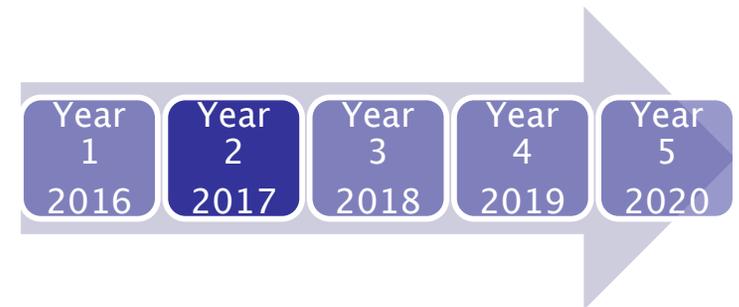
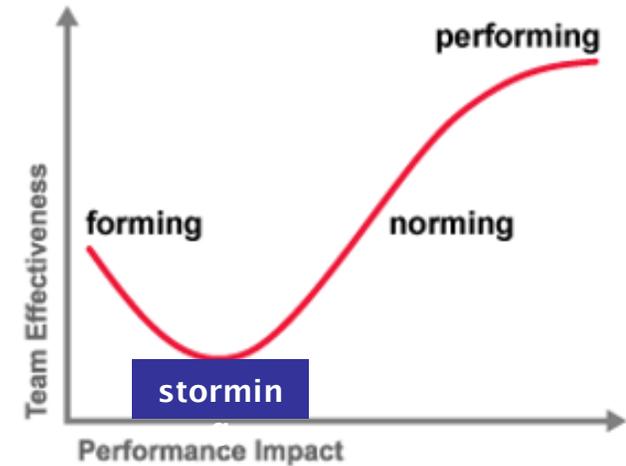
Phase 1: Ideology and Talent development - Forming

- Industry needs to shift its thinking from purchasing to supply chain management.
- Less transactional and more strategic
- Teaming and problem solving
- Upstream involvement in design, and business capture
- Gap analysis of current organizational structure and needs to support business
- *Result : Hired Product line leads to work with supply base . Engineering and process disciplines and development of commodity teams(site based)*



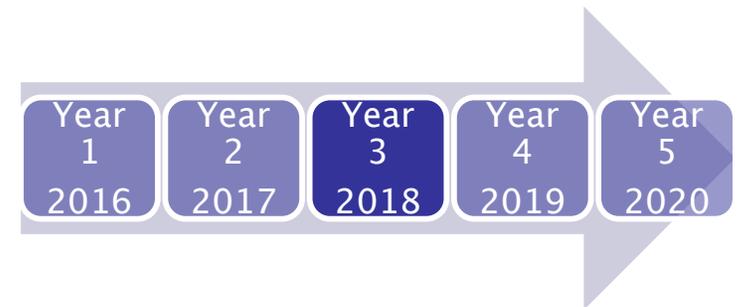
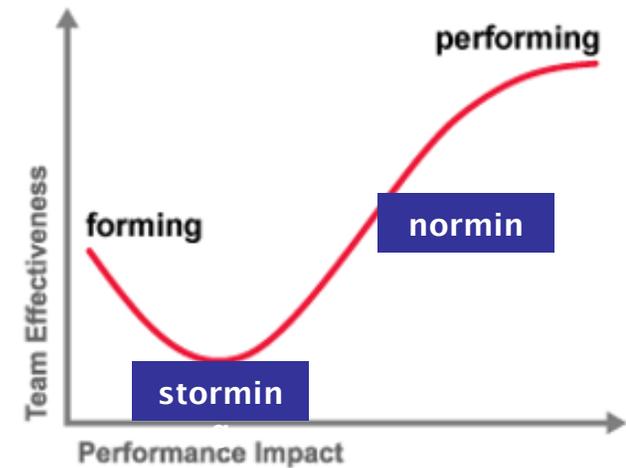
Phase 2: Risk Mitigation/ Supplier performance - Storming

- Defining roles and responsibilities
- Forming teams
- Supplier metrics - Visibility
- Supplier segmentation
- “Advertising” new changes and skill base
- Change from silo to team approach
- Improved communication
- *Result: taking longer than expected . Old transactional verses new strategic planning. Silo verses teaming. Comfort zones and information sharing. Hiring more program focused staff.*



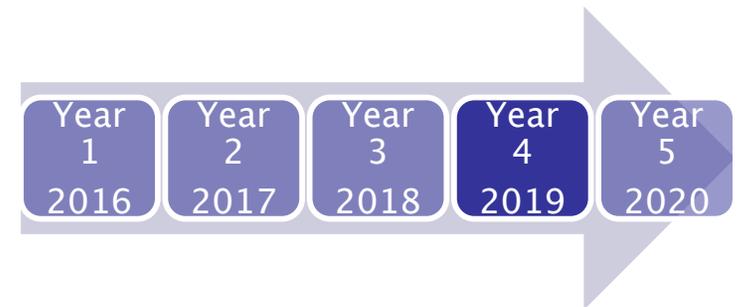
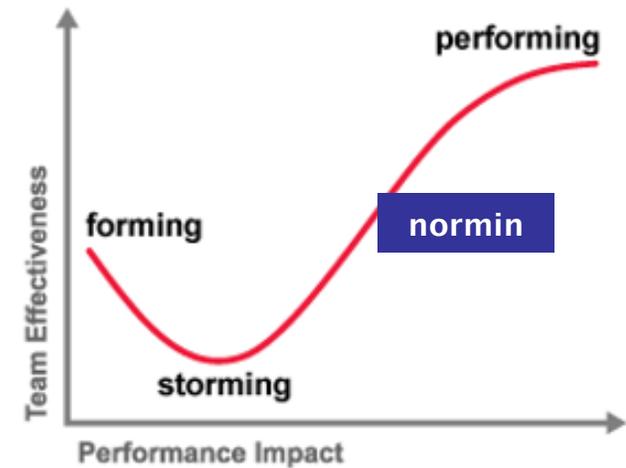
Phase 3: Risk Mitigation/Supplier Development - Storming/Norming

- Consolidation of supply base
- Upfront mitigation and reviews
- Proactive supply base improvement
- Stabilized supplier segmentation
- Routine monitoring of supply base
- Implementation of corrective actions
- Improved communication
- Roles defined
- Team sharing and mentoring
- Integration into Business Units
- Training and education
- *Results: Supplier performance criteria defined. Process walk to identify gaps and define responsibilities..*



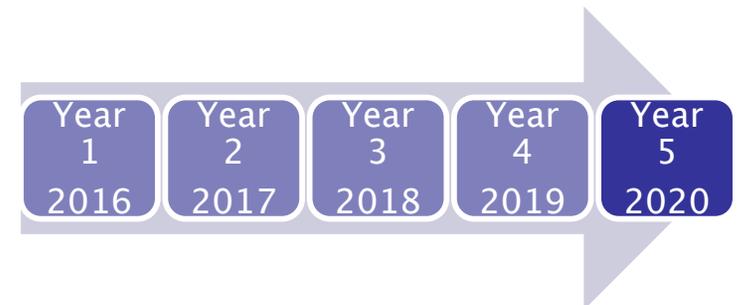
Phase 4: Supply Chain Design /Process Standardization - Norming

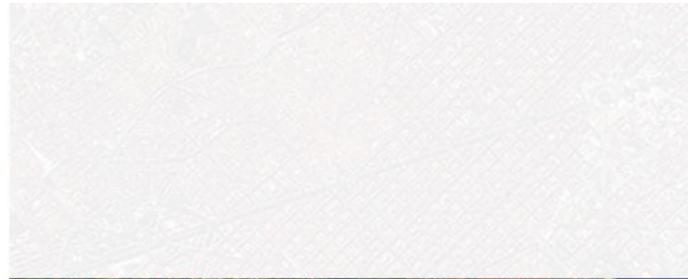
- Integrated into strategy planning with business units
- Evaluate supply base and design supply chain accordingly
- Risk Mitigation and reviews have regular cadence and checklists
- Roles and responsibilities are clearly defined
- Information and Teaming is transparent
- Supply chain issues have structured problem solving approach
- Processes are walked and standard work is formed and documented Group wide
- Product Line leads increase responsibility to SDG – Group wide commodity teams



Phase 5: Group Integration/process standardization/ cost reduction/continuous improvement - Performing

- Commodity teams work at group levels
- Transparent sharing
- Resource sharing
- Business unit needs brought to commodity teams and supply chain design solutions become part of business capture and execution strategy
- Structured problem solving is standard
- Process standards have been benchmarked, rolled out and are being improved for flow and efficiency
- Work standardization, in regards to, supplier evaluation checklists, kickoff meetings, and risk assessments
- Proactively working with suppliers on cost and leadtime reduction
- Partnering agreements with key suppliers





Supply Chain Tools

Risk Mitigation – Risk assessment

		Part complexity	Long leatime	Past quality issues	Problem supplier	Supplier performance	Moog internal issues	Past purchase history
Commodity	Supplier	WHY RISKY?						
machining (example)	TBA	Y	Y				Y	NA
enclosures								
seals/guide rings/scrapers								
springs								
bearings								

Risk Mitigation – Tools to manage

Commodity	Supplier	Multiple times per week telecoms	Weekly telecoms	Bi-monthly telecoms	Periodic Check-in	Moog Visit to Supplier	Supplier Visit to Moog	Kick-Off Meeting	Drawing Review	Review Past NCs and Waivers	Compliance Matrices (drawing, spec, quality flowdowns)	Production plan / Schedule with Milestones	SOW/SDRLS	TIM	PDR	CDR	MRR
		PO MANAGEMENT															
		Calls				Visits		Risk Mitigation Plans									
machining (example)	TBA			Y				Y	Y			Y					Y
enclosures																	
seals/guide rings/scrapers																	
springs																	
bearings																	

Supplier selection matrix

Technical - Section I		
Specification Compliance Matrix	5%	0-5
Technical Proposal or Design	5%	0-3
Supplier Evaluation Risk (SER) Rating (DUNS)	5%	1-4
Failure Score (DUNS)	ref.	1-100
Moog Product Quality (TIPQA)	ref.	0-100
Moog Blended Product Delivery and Quality (TIPQA)	ref.	0-100
Moog ASL Status	ref.	
Subtotal:	15%	
Management - Section II		
SOW Compliance Matrix	5.0%	0-5
Program Team Structure and Staffing Plan	1.0%	0-3
Milestone Schedule/Lead Time (target 16 wks)	10.0%	0-4
Part Production Capacity Plan	1.0%	0-5
Quality and Contractual Flowdowns (T&Cs, SSQRs)	1.0%	0-5
Small Business Plan or Designation (DUNS)	1.0%	3-4
Completed Data Rights Assertion Template	1.0%	1-5
SDRL Data Delivery and Management	1.0%	1-5
Certifications (AS9100C or D)	1.0%	4-5
Vertical Integration (metallurgy, welding, NDT, precision cleaning, heat treatment)	10.0%	0-4
Source Inspection Controls (Moog MIPs, Gov. MIPs)	1.0%	0-5
Responsiveness (DUNS)	1.0%	1-4
Sub-Tier Supplier Controls (raw material, OSP, outside testing)	1.0%	0-5
Product Delivery/Timeliness (DUNS)	10.0%	1-4
Product Quality (DUNS)	10.0%	1-4
Subtotal:	55%	
Pricing - Section III		
Non-Recurring Costs (Engineering, Tooling, Testing)	10%	1-3
Unit Pricing	10%	1-5
Geography/Travel (Supplier Proximity)	10%	1-4
Subtotal:	30%	
Scoring Summary		
Technical	15%	
Management	55%	
Pricing	30%	
Overall Score:	100%	

Supplier selection - Technical

<u>Supplier Candidate</u>			Supplier F	Supplier D
<u>Moog ASL Vendor Number</u>			12328	27613
<u>Branch DUNS Number</u>			removed	removed
<u>CAGE Code</u>			removed	removed
<u>Total Employees</u>			110	50
<u>Factory Location (State)</u>			TN	IL
<u>Technical - Section I</u>				
Specification Compliance Matrix	5%	0-5	0	0
Technical Proposal or Design	5%	0-3	3	0
Supplier Evaluation Risk (SER) Rating (DUNS)	5%	1-4	2	4
Failure Score (DUNS)	ref.	1-100	10	73
Moog Product Quality (TIPQA)	ref.	0-100	NR	NR
Moog Blended Product Delivery and Quality (TIPQA)	ref.	0-100	NR	NR
Moog ASL Status	ref.		DA	U

Supplier Selection- Management

<u>Management - Section II</u>				
SOW Compliance Matrix	5.0%	0-5	0	0
Program Team Structure and Staffing Plan	1.0%	0-3	3	0
Milestone Schedule/Lead Time (target 16 wks)	10.0%	0-4	3	0
Part Production Capacity Plan	1.0%	0-5	0	0
Quality and Contractual Flowdowns (T&Cs, SSQRs)	1.0%	0-5	0	0
Small Business Plan or Designation (DUNS)	1.0%	3-4	3	4
Completed Data Rights Assertion Template	1.0%	1-5	0	0
SDRL Data Delivery and Management	1.0%	1-5	0	0
Certifications (AS9100C or D)	1.0%	4-5	4	4
Vertical Integration (metallurgy, welding, NDT, precision cleaning, heat treatment)	10.0%	0-4	4	0
Source Inspection Controls (Moog MIPs, Gov. MIPs)	1.0%	0-5	0	0
Responsiveness (DUNS)	1.0%	1-4	3	4
Sub-Tier Supplier Controls (raw material, OSP, outside testing)	1.0%	0-5	0	0
Product Delivery/Timeliness (DUNS)	10.0%	1-4	3	3
Product Quality (DUNS)	10.0%	1-4	3	3
Subtotal:	55%			

Supplier Selection -Pricing

Pricing - Section III				
Non-Recurring Costs (Engineering, Tooling, Testing)	10%	1-3	3	1
Unit Pricing	10%	1-5	3	5
Geography/Travel (Supplier Proximity)	10%	1-4	2	4
Subtotal:	30%			

Supplier Selection - Summary

Scoring Summary	
Technical	15%
Management	55%
Pricing	30%
Overall Score:	100%

Summary

- Redefining face of Supply Chain
- Staff to support success of suppliers-collaboration vs posturing
- Supply chain design to meet customer requirements
- Strategic Selection and management
- Predictable and performance based suppliers
- Structured problem solving
- Dfx activities with supply base to minimize risk associated with manufacturability, cost and schedule